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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

MAILED

NOV 14 2007

GROUP 3600

Application Number: 10/627,080
Filing Date: July 25, 2003
Appellant(s): WOLF ET AL.

Cary Kappel
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 7-27-07 appealing from the Office action mailed 2-20-07.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

4,936,811	BAKER	06-1990
6,672,596	DEVERS	1-2004
JP 56-62464	TAKEDA et al.	10-1982

5,026,323 FUKUMURA et al. 6-1991

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

1. Claims 1-3 and 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baker (4,936,811) in view of Devers (6,672,596).

Baker discloses an axle boot comprising a joint housing 16 having plural radial recesses 16b and a bellows 12. The bellows is made of TPE and has an integral connecting collar 15 including a plurality of indentations projecting radially inward and adapted to recesses 16b (see Fig. 2 and col. 3, lines 62-65). A plurality of compensating pieces 22 is attached to an outer surface of the collar to form a cylindrical outer circumference for a clamp 23. The pieces are all connected and include ring sections (near 22) to connect adjacent pieces. The projecting portion of the pieces has a length corresponding to the recess.

Baker does not disclose ring sections wherein at least one ring section is elastically deformable, that the pieces are made of more than one material, or that the pieces have a web. Devers teaches an axle boot having a joint housing and bellows. Devers teaches a plurality of compensating pieces with the bellows. The pieces are connected as a single piece component having ring sections (near 32), wherein at least one is elastically deformable (see col. 4, line 12), which allows the component to be installed. Devers also teaches the compensating pieces include more than one material (i.e. insert 44 is a harder material than the rest of element 40). The pieces are a hollow (air-filled) body having flexible walls/ webs (e.g. Fig. 7). Devers teaches that this compensating component provides a more uniform stiffness and compression, thus providing a more uniform sealing and clamping force. Therefore, it would have been obvious for one of

ordinary skill in the art at the time the invention was made to modify the compensating component of Baker with the unified component taught by Devers to provide a more uniform sealing and clamping force.

2. Claims 13 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent 56-62464 (JP '464).

JP '464 discloses a boot comprising a joint housing including an external contour with radial recesses. A bellows has a color with plural indentations (e.g. 26) adapted to the recesses. A clamp 11 or 27 with integrated connecting pieces 28 or 14 is disposed around the collar to form a cylindrical outer surface. It is not clear if the pieces are connected to the collar via a rivet. The examiner takes Official Notice that it is well known to one of ordinary skill in the art to use a rivet as a means to connect two pieces. Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to use a rivet to connect the collar and piece with a rivet.

3. Claims 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP '464 as applied to claim 13 above, and further in view of Devers.

Devers teaches an axle boot having a joint housing and bellows. Devers teaches a plurality of compensating pieces with the bellows. Devers also teaches the compensating pieces include more than one material (i.e. insert 44 is a harder material than the rest of element 40). The pieces are a hollow (air-filled) body having flexible walls/ webs (e.g. Fig. 7). Devers teaches that this compensating component provides a more uniform stiffness and compression, thus providing a more uniform sealing and clamping force. Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to modify the

compensating pieces of JP '464 with the pieces taught by Devers to provide a more uniform sealing and clamping force.

(10) Response to Argument

Baker in view of Devers

Appellant argues that there is no motivation to modify the pieces of Baker to provide an elastically deformable single piece component. And, Appellant argues that Baker teaches away from such elasticity. The examiner disagrees.

First, KSR forecloses the argument that a specific teaching, suggestion or motivation is required to support a finding of obviousness (see Ex parte Smith, USPQ2d at 1396).

Also, Baker does not teach away from the use of an elastically deformable single piece component. Baker discusses some disadvantages with prior art boot assemblies in col. 1, lines 41 to col. 2. However, these disadvantages relate to the material used for the boot/bellows and to the large diameter needed for these boot. Baker solves these problems by using a different material and by using the clamp on the outer surface of the boot, not between the boot and housing. Baker provides a plurality of compensating pieces connected to each other by tongue and groove connections. The pieces 30 are free to move in the concave depressions, but may also be tack welded in place until clamped (col. 2, lines 55-68) via clamp 23. Once clamped, the pieces will be fixed in place. Baker's construction (i.e. the tongue and groove) allows the clamping force to be transmitted to the boot itself. However, modifying this construction so that the pieces are connected with elastically deformable ring sections to form a since piece component will not affect this. The single piece component taught by Devers will still allow clamping forces to be transmitted to the boot itself. Additionally, Devers' component will be

easier to install. As seen best in Figure 1, Devers teaches a single piece component 40 having compensating pieces (near line 42) connected by ring sections (e.g. near line 41) that are elastically deformable (see col. 4, line 12). This pliability of the material will still permit movement of the pieces within the recess. Further, this component offers a uniform sealing and clamping forces (e.g. see col. 1, lines 49-52) as well as ease in installation.

Appellant argues that Devers does not teach the bands being able to expand over the circumference of the connecting collar. This argument is unpersuasive. The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). In this case, Baker already discloses the arrangement and proper placement of the components required by the claims (i.e. Baker discloses the compensating pieces on the connecting collar). Devers is being applied for its teaching of a one-piece construction of these compensating pieces. Devers teaches that the unit has enough pliability to fit over whatever element it will surround. Thus, it would be obvious that it would have enough pliability to fit over the connecting collar when used with Baker.

Additionally, it has been held that the use of one-piece construction is obvious. See In re Larson 144 USPQ 347, 348 (CCPA 1965).

Baker in view of Devers for claim 9

Appellant argues that Devers does not teach compensating pieces include more than one material, each having a different hardness. The examiner disagrees. As seen in Figures 1 and

the compensating pieces comprise at least two materials at 41 and 44. Portion 44 has a greater rigidity than portion 41 (see col. 3. lines 63-67).

JP '464

Appellant argues that JP '464 does not appear to be rivetable. The examiner disagrees. First, it is noted that the examiner took official notice that it is well known to use a rivet as a means to connect two pieces (in office action of 9-18-06). The examiner also noted (in the final rejection of 2-20-07) that Appellant did not argue that it is not well known to use a rivet as connection means in the following reply. Thus, the examiner noted that Appellant has conceded that such is admitted prior art (i.e. is known). In that reply as well as in this brief, Appellant is only arguing that there is no showing how to use rivets. The examiner submits that it would be obvious to one of ordinary skill in the art how to use a rivet to connect two elements. In other words, if it is known to use a rivet to connect two things, then it should be obvious how to *use* the rivet to connect two elements. Regardless, the examiner directed Appellant to Fukumura '323, which shows a boot seal having two elements 5 and 1 connected by a "rivet" 7 means. JP '464 discloses that the compensating pieces (e.g. 14) can be joined to the body 11 (see page 4, lines 2-3 of translation provided). However, JP '464 does not appear to specifically state how they are "joined." It would have been obvious to use any known joining means. And, rivets are a known joining means as conceded by Appellant.

JP '464 claim 15

Appellant argues that JP '464 does not show or teach that the circumferential length of each of the pieces corresponds approximately to the length of the radial recess. The examiner disagrees. Attention is directed to Figures 6a-c. Compensation pieces 28 have a circumferential

length that "approximately" corresponds to the shape of the recesses 23. Such portions fit together in a manner similar to that shown in Figure 2.

JP '464 in view of Devers

Appellant argues that Devers does not disclose how rivets would be used in JP '464. This argument is unpersuasive. As set forth above, it would have been obvious to use a known joining means to join the components (e.g. 14 and 11 or 28 and 27) together.

Appellant argues that there is no teaching or disclosure to combine the band of JP '464 with the seal adaptor assembly in Devers. The examiner disagrees. First, KSR forecloses the argument that a specific teaching, suggestion or motivation is required to support a finding of obviousness (see Ex parte Smith, USPQ2d at 1396). However, in this case, Devers teaches compensating pieces that provide more uniform stiffness and compression, thus providing more uniform clamping forces (see col. 4, lines 1-9). This is motivation to modify the pieces of JP '464.

JP '464 in view of Devers claim 19

Appellant argues that Devers does not disclose a radial web. The examiner disagrees. Attention is directed to Figure 7 of Devers, which shows a radial web in compensating piece 71.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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PTO 08-0511

CC = JP
[None given]
Utility Model
56062464

JOINT BOOT TIGHTENING BAND
[Tsukite yo buto shifuke bando]

Koichi Takeda et al.

UNITED STATES PATENT AND TRADEMARK OFFICE
WASHINGTON, D.C. OCTOBER 2007
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DOCUMENT KIND	(12):	Utility Model
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APPLICATION DATE	(22):	19791019
INVENTORS	(72):	Koichi Takeda, et al.
APPLICANT	(71):	Toyota Motor Corporation
TITLE	(54):	JOINT BOOT TIGHTENING BAND
FOREIGN TITLE	[54A]:	Tsukite yo buto shifuke bando

Claim *1

A joint boot tightening band characterized in that in a joint boot tightening band that is used to tighten a boot attached to the outer periphery of noncircular parts of an outer member that houses a joint part, bulged parts are formed on the inner periphery of the band at the positions that correspond to nonbulged parts formed on the outer periphery of the outer member.

Detailed explanation of the invention

The present model pertains to a joint boot tightening band that is used with a universal joint. In particular, it pertains to a joint boot tightening band that is suitable for use with a universal joint wherein the outer periphery of an outer member that houses a joint part is formed into a noncircular shape.

When tightening a boot that is attached to an outer member with a noncircular outer periphery, a conventional band made of a simple belt-shaped member is used in the same manner as that with an outer member with a circular outer periphery. However, when tightening boot around the noncircular /2
outer periphery of the outer member using the band with said simple belt-like shape, an insufficient surface pressure is created at a sealing part that is formed between a nonbulged outer member portion of the noncircular outer periphery and the band, and the boot gets deformed unevenly in the circumferential direction, resulting in the risk for grease leakage. Also, there is a problem that it is difficult to set a proper boot tightening margin for the prevention of said grease leakage and a proper sealing part shape.

The present model was invented in the light of the aforementioned conventional problem, and its purpose is to present a joint boot tightening band capable of improving the sealing characteristic between the outer member with the noncircular outer periphery and the boot.

* [Numbers in right margin indicate pagination of the original text.]

In order to achieve the aforementioned purpose, in the case of the present model, in a joint boot tightening band that is used to tighten a boot attached to the outer periphery of a noncircular part of an outer member that houses a joint part, a bulged part is formed on the inner periphery of the band at the position that corresponds to a nonbulged part formed on the outer periphery of the outer member.

An application example of the present model will be explained below with reference to figures. /3

Figure 1 and Figure 2 are diagrams showing a first application example of the joint boot tightening band pertaining to the present model. Joint part 2 is housed inside of outer member 1, and shaft 3 is connected to joint part 2. Boot 5 is attached to attachment groove 4 formed on the outer periphery of outer member 1 at one end and fixed there as it is tightened using band 6. The other end of boot 5 is fixed to shaft 3 as it is tightened at a part not shown, and grease for lubricating joint part 2 is encapsulated inside of outer member 1 and boot 5.

Here, as for the cross-sectional shape of outer member 1 at the part where boot 5 is attached, as shown in Figure 3, convex surface parts 7, that form the same circumferential surfaces, and planar parts 8, that form chords at the distance of L from the circumferential surfaces formed by convex surface parts 7, are formed alternately at 3 positions, whereby the outer periphery of outer member 1 is formed into a noncircular shape.

In addition, the cross-section of the part that is attached to outer member 1 of boot 5 and tightened using band 6 is formed into the shape shown in Figure 4. That is, the inner surface attached to outer /4 member 1 is slightly smaller than yet analogous to the outer circumferential shape of outer member 1 while comprising concave surface parts 9 to be attached to convex surface parts 7 of outer member 1 and planar parts 10 to be attached to planar parts 8 of outer member 1. In addition, the outer surface part that comes into contact with band 6 is formed into a circular shape.

Furthermore, band 6 is formed as a snap-on type of the kind shown in Figure 5; wherein, it is configured with belt-shaped metallic member 11 that is curved into a ring shape with end parts to be

joined together, lever 12 that is fixed to the outer side of one of the joint parts in a slightly overlapping manner, clip 13 that is fixed to belt-shaped member 11, and bulged parts 14 that are joined to or formed as one body with the inner periphery at the parts that correspond to planar parts 8 of outer member 1. Here, the amount bulged part 14 bulges inwardly from belt-shaped member 11 is set to 1.5 L or less. When tightening said snap-on type band 6, lever 12 is tilted and turned in the direction indicated by the arrow while using the outer end part of lever 12 as force point 12A, the inner end of lever 12 as fulcrum 12B, and the point where lever 12 and belt-shaped member 11 are fitted together as working point 12C, /5 whereby moving part 12D on the opposite side is moved gradually via the position of clip 13 on belt-shaped member 11 and lever 12 so as to tighten belt-shaped member 11 by reducing its diameter.

Next, function of the aforementioned first application example will be explained. Boot 5 is fitted to the outer periphery of outer member 1, that is configured with convex surface parts 7 where attachment groove 4 is formed and planar parts 8, in such a manner that concave surface parts 9 are fitted to convex surface parts 7, and planar parts 10 are fitted to planar parts 8, respectively. While belt-shaped member 11 is open, band 6 is placed over the outer periphery of boot 5 at the positions where bulged parts 14 match planar parts 8 of outer member 1 and planar parts 10 of boot 5. Then, when fulcrum 12B of lever 12 is brought to an arbitrary part of boot 5, and lever 12 is pushed down, moving part 12D of belt-shaped member 11 moves in the direction the diameter of belt-shaped member 11 is reduced gradually so as to bring concave surface parts 9 of boot 5 into close contact with convex surface parts 7 of outer member 1 and compress the thick parts of boot 5 where planar parts 10 are formed using bulged parts 14 in the manner shown in Figure 2 so as to bring planar parts 10 of boot 5 into close contact with planar parts 8 /6 of outer member 1 in order to tighten boot 5 evenly around the entire circumference of the outer periphery of outer member 1.

According to the aforementioned application example, because thick parts of boot 5, that are formed at the positions that correspond to planar parts 8 as nonbulged parts formed on the periphery of outer

member 1, are pressed by bulged parts 14 formed on band 6, the contact pressure generated between outer member 1 and boot 5 is never reduced even at the bulged parts of outer member 1. As such, both components are kept in close contact with each other over the entire circumference, and the contact pressure at the sealed surface is hardly reduced even in the event of deterioration of such a material as rubber that is used to configure boot 5, so that a good sealing characteristic can be assured. In addition, because the sealing characteristic can be assured easily, the shape of the part where the boot is attached to the outer member with said noncircular periphery can be designed easily.

Figure 6 (A), (B), and (C) are diagrams for explaining a second application example of the joint boot tightening band pertaining to the present model. That is, the periphery of outer member 21 is formed into a noncircular shape that comprises convex surface parts 22 and concave surface parts 23 that are /7
recessed inwardly from the contour lines of convex surface parts 22 by distance L. Boot 24 to be attached to said outer member 21 has the cross-sectional shape shown in Figure 6 (B) at the part at which it is attached to said outer member 21; wherein, an inner circumferential shape slightly smaller than the contour line of outer member 21 and an outer circumferential shape that is almost parallel to said inner circumferential shape are formed. Concave surface parts 25, that come into contact with convex surface parts 22 formed on outer member 21, and convex surface parts 26, that come into contact with concave surface parts 23 formed on outer member 21, are formed on the inner periphery of said boot 24. Furthermore, as shown in Figure 6 (C), band 27, that is used to tighten boot 24 fitted to outer member 21, has bulged parts 28 having an inward convex-surface-like shape with a maximum bulging amount of roughly 1.5 L or less that are formed at the parts of the inner periphery that correspond to concave surface parts 23 of outer member 21. Here, band 27 may be of a snap-on type with a lever similar to that shown in the aforementioned first application example, or it may be of a type that involves screws to tighten both ends of a belt-shaped member.

That is, according to the aforementioned second application example, when the diameter of band 27, that is attached to the outer periphery of boot 24, of which concave surface parts 25 are fitted to convex /8
surface parts 22 of outer member 21, and convex surface parts 26 are fitted to concave surface parts 23, while positioned in such a manner that its bulged parts 28 meet concave surface parts 23 of outer member 21 and convex surface parts 26 of boot 24, is reduced, convex surface parts 26 of boot 24 are pushed against concave surface parts 23 of outer member 21, and boot 24 is tightened in close contact with the entire circumference of outer member 21.

As described above, in the joint boot tightening band that is used to tighten the boot to be attached to the noncircular periphery of the outer member that houses the joint part, the bulged parts are formed at the positions of the inner periphery of the band that correspond to the nonbulged parts on the outer periphery of the outer member, so that the joint boot tightening band pertaining to the present model creates an effect that the boot can be tightened while attaining a good sealing characteristic with respect to the outer member with the noncircular periphery.

Brief description of the figures

Figure 1 is a cross-sectional view showing a first application example of the joint boot tightening band pertaining to the present model; Figure 2 is a cross-sectional view along the II-II line in Figure 1; Figure 3 is a cross-sectional view showing an outer member used in said application example; Figure 4 is a cross-sectional view showing a boot used in said application example; Figure 5 is a front view /9
showing a band used in said application example; and Figure 6 (A), (B), and (C) are diagrams for explaining a second application example of the joint boot tightening band pertaining to the present model.

1, 21 ... outer member; 2 ... joint part; 5, 24 ... boot; 6, 27 ... band; and 14 ... bulged part.

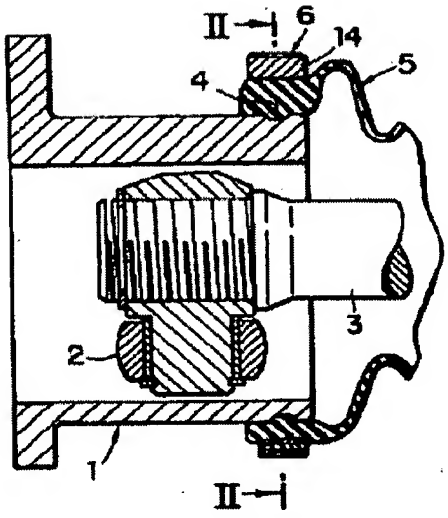


Figure 1

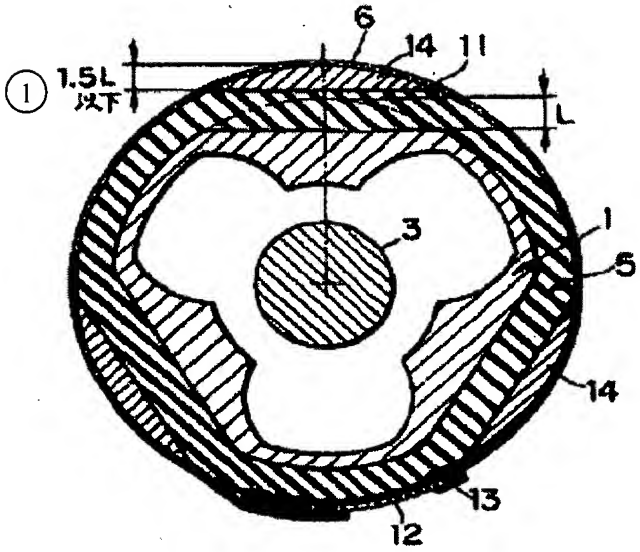


Figure 2

Key: 1 1.5 L or less

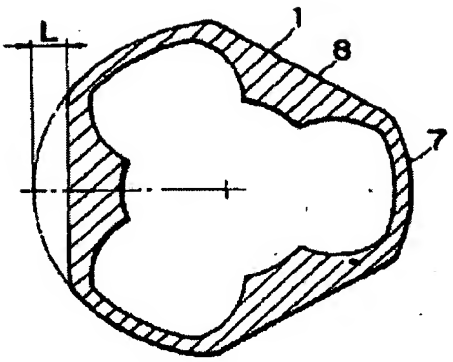


Figure 3

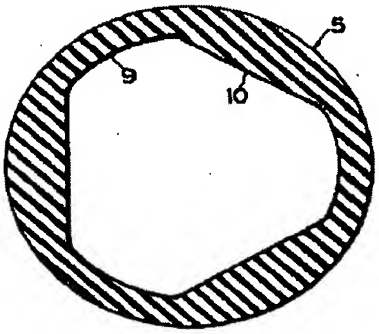


Figure 4

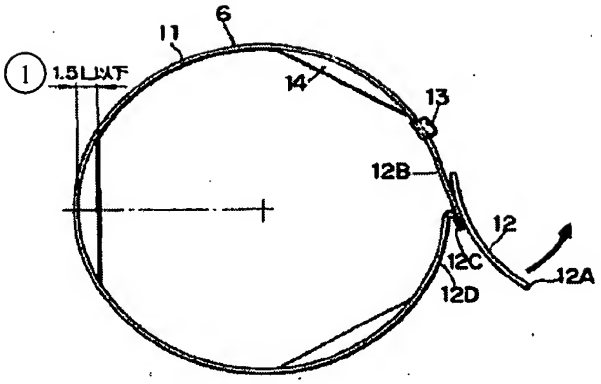
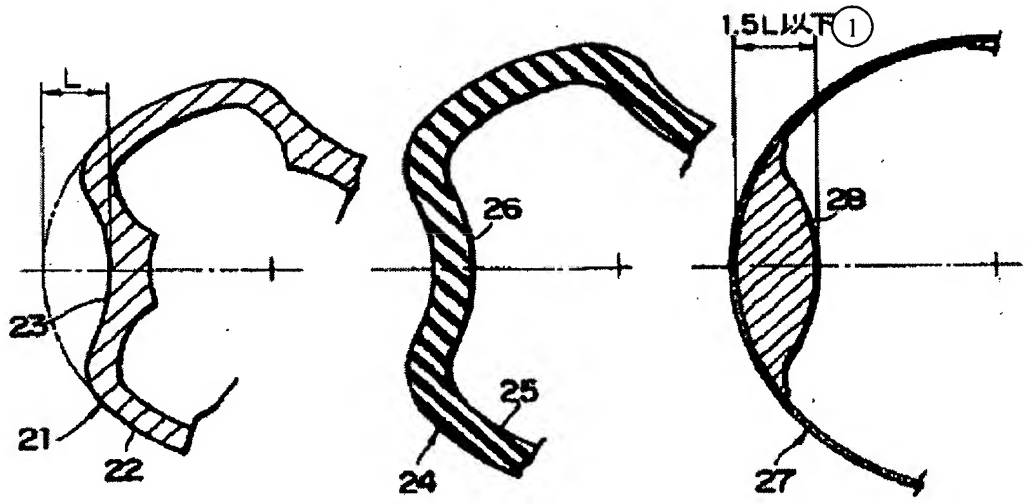


Figure 5

Key: 1 1.5 L or less



(A) (B) (C)

Figure 6

Key: 1 1.5 L or less